Science and Art.

Cheap Microscope.

There is a man who sometimes stands in Leicester square, London, who sells microscopes at one penny each. They are made of a common pill-box; the bottom taken out, and a piece of window glass substituted; a small hole is bored in the lid, and therein is placed a lens, the whole apparatus being painted black. Upon looking through one of these microscopes, I was surprised to find hundreds of creatures, apparently the size of earthworms, swimming about in all directions yet on the object glass nothing could be seen but the small speck of flour and water, conveyed there on the end of a lucifer match, from a common inkstand, which was nearly full of this vivified paste. I bought several of these microscopes, determined to find out how all this could be done for a penny. An eminent microscopist examined them, and found that the magnifying power was 20 diameter. The cost of a lens made of glass of such power would be from 3s. to 4s. How, then, could the whole apparatus be made for a penny? A penknife revealed the mystery. The pill-box was cut in two, and then it appeared that the lens was made of Canada balsam, a transparent gum. The balsam had been very cleverly dropped into the eye-hole of the pill-box. It then assumed the proper size and transparency of a well-ground lens. Our ingenious lens maker informed me that he had been selling these microscopes for fifteen years, and that he and his family conjointly made them. One child cut the pill-box, another the cap, another put them together, his wife painted them black, and he made the lens.—[Dicken's Household Words.

Preserving Milk.

The Abbe Moigno, of Paris, describes a mode of preserving milk, by which he has kept the article sweet for six months at a time. He does not tell us first how to get the pure article, but once obtained, this is his plan:

"The vessels used were cylindrical iron bottles, each fitted with a leaden tube at the top. The bottle and tube having been filled to the boiling point with milk so as to exclude the atmospheric air, the latter was pinched a little below the top, so as to close it completely. It was then cut off at the part pinched, and the bottle and what part of the tube remained being entirely free of air, no decomposing action could possibly ensue."

On the plans previously adopted, it had always been found inevitable to enclose a little air, so that it was necessary to expose it to a high temperature, in order that the oxygen in that bubble might be absorbed by the organic substance. The plan of Gail Borden, Jr., of Texas, (inventor of the Meat Biscuit,) for preserving milk, we consider far superior to this. It consists in evaporating the water in the milk, in a pan excluded from the atmosphere, and using a small quantity of sugar as a preservative. By this plan pure solid milk can be obtained, which can be carried about in very small bulk, from one end of the world to the other.

A New Light.

A correspondent hands us the following:

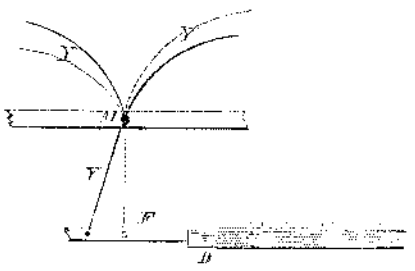
"An important discovery, after five years incessant labor, has lately been completed by a gentleman residing near New York, which is expected to cause a great revolution in the prices of coal and gas. It is an entire new light, white in color, resembling the light of day. It will be cheap and fit for all purposes that gas is now used. One great advantage in the invention is its applicability to the production of heat for domestic purposes of every kind. It will be able to be obtained at such a price as will be within the means of every person. It is called "Arthur's Washington Light." It will supersede the necessity of laying down gas piping in streets and houses, as it is portable, and requires no piping of any kind, and can be carried without inconvenience from one room to another. The lamp is not easily put out of repair, and requires no care after once lighting. It is perfectly safe, and not liable to the accidents of other lamps. The inventor is most sanguine as to its applicability to all locomotive engines, instead of coal or other fuel."—[N. Y. Tribune.

[One thing is very *clear*; viz., this light is very *dark*. We are of the opinion that this "Arthur's Washington Light" will prove to be something like the New York Washington Monument"—a work of imagination.

History of Reaping Machines.—No. 6.

Following the last ingenious but complex mechanical contrivance we have one that nearly reaches the other extreme of simplicity. It was the invention of Henry Ogle, schoolmaster, of Rennington, in 1822.

FIG. 22.

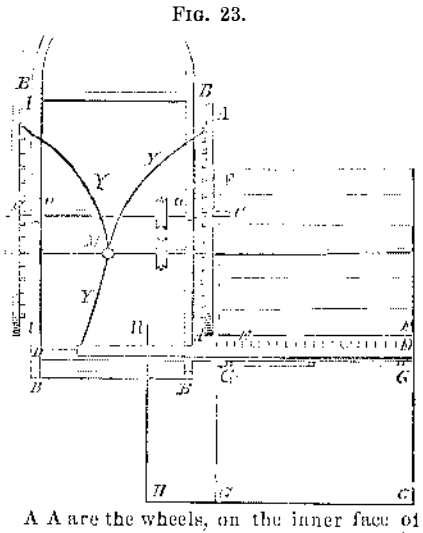


The annexed figure, 22, illustrates the cutting arrangement, the essential feature of this machine.

D is is a frame of wood or iron with teeth projecting about three inches; E is the knife which acts upon the bar, D; Y Y Y is an instrument fixed on a center upon a frame at M, turns upon it and acts in teeth on the inner side of two main wheels, one end of the instrument catching alternately with the other in the teeth or cogs, thus keeping the knife sliding in and out, with a very quick motion.

Figure 23 is an underside plan view of this machine, showing that it had the reel which is now employed on all reapers, and it also shows the peculiar manner of giving the cutter a reciprocating motion from side to side.

FIG. 23.



A A are the wheels, on the inner face of which are pins set at certain distances apart, the space on one wheel being opposite to the pin on the other wheel. The arms, Y Y, are made of tough wood—wood springs—and press against the face of the wheels. The inner end of Y is a single arm attached to the cutter blade. It will therefore be evident that as the wheels revolve, the pins on their inner faces will so actuate the spring arms as to give the cutter, E, a motion alternately from side to side; C is the axle of the wheels working the bearings, O O, and M is the spindle or shaft of the reel, F F, which is set higher in the frame, B B, than the wheel axle, and receives a rotary motion by a band and pulley.

The cut grain falls on the platform, G G, and the vibration of the arms which operate the cutter, is shown by dotted lines, figure 22. A perspective view of this machine was published in the London *Mechanics' Magazine*, and it was therefore known to the public for more than thirty years.

From a trial of this machine it was estimated that it would cut fourteen acres per day with ease, but Mr. Ogle, schoolmaster, says, "some working people at last threatened to kill Mr. Brown (the maker of the machine) if he persevered any further in it, and it has never been more tried,"

Up to this period, notwithstanding the ingenuity which had been expended upon reaping machines, none had been produced which has stood the test of time, or which embraced all the principles that have been incorporated into the effective reapers of the present day, but in 1826 the Rev. Patrick Bell, of Scotland, invented an apparatus for reaping grain, which is the oldest known machine that is still in use. This may be said to be the advent of successful reaping by machinery, and in our next we shall give full illustrations of his machine.

A Valuable Mineral.

Gold, silver, and precious stones are held to be the most valuable minerals in the world, but they are not so essentially. Coal and iron are really more valuable than diamonds or gold, and to these we must add another mineral which is the most valuable ever discovered. Our constant readers will remember that we published the opinions of very celebrated chemists on page 10, last volume SCIENTIFIC AMERICAN, given in a trial at law at Edinburgh, respecting what was called Torbanehill Gas Coal, and how some of those chemists (Brande, Rose, Ansted, &c.) asserted it was not coal but a bituminous shale; while others (Johnson, Fyfe, Hoffman, Maclagan, &c.) asserted it was coal—only a superior quality of cannel. The jury decided that it was a coal, but it is still a disputed question with the scientific men of Europe, the German chemists generally inclining to the anti-coal side of the question, while the British chemists generally stand on the other side. But be it coal or shale the mineral has no equal in the world for light-producing qualities. By the *Edinburgh Witness*, Hugh Miller's paper, we learn that at a law suit lately prosecuted in London, one of the parties, James Young, of Bathgate, on being sworn deposed, that "he manufactured and sold at the rate of 8000 gallons a week" of the Paraffine oil, which is procured from the Torbanehill new mineral. 8000 gallons a week are 416,000 gallons a year, and accordingly Mr. Young's counsel, Mr. Bramwell, stated that his client sold (in round numbers) "400,000 gallons of this oil yearly," Mr. Bramwell adding, "at 5s. per gallon." That is, Mr. Young stated, while his counsel repeated the statement, that from the chemical works near Bathgate, which prepare the Paraffine oil procured from the Torbanehill mineral, there are sold of that valuable oil £100,000 (nearly $500,000) worth yearly, and it is to be borne in mind that the greater portion of this very large yearly sum is *clear profit*. It was also added, that Mr. Young was only one of many parties in Europe who ordered and obtained this mineral for making oil, and producing gas. This mineral is only obtained from a small district in Scotland, and from the foregoing, some idea of its immense value, in a commercial point of view, may be obtained.

We invite the attention of our geologists and mineralogists to search for minerals of the same character and quality in our own country. We have no doubt but they exist in some of our extensive and rich coal basins, especially in the neighborhood of the cannel coal beds in Virginia, Pennsylvania, Kentucky, Indiana, and Missouri.

The "Electrical Motor" Destroyed by a Mob.

A letter from John M. Spear, published in the *Spiritual Telegraph*, contains the following information concerning the destruction of the machine built at Lynn, which was represented by its friends to be endowed with life. and was styled by some persons a "new Savior:"—

"From the hour that it became publicly known that the Association of Electricisers had undertaken to introduce to the inhabitants of this earth a new motive power, the press and the pulpit have assailed, ridiculed, and misrepresented it, until a public sentiment has been generated which encouraged the mob to assail and destroy it. It was moved, as you know, to Randolph, N. Y., that it might have the advantages of that lofty electrical position. A temporary building was erected to shelter it. Into this, under the cover of the night, the mob entered, tore out the heart of the mechanism, trampled beneath their feet, and scattered it to the four winds."

[We copy the above from an exchange, not from the *Spiritual Telegraph*, which we have not seen. We do not believe a word respecting a mob breaking into the building and destroying the spiritual machine. We are of the opinion that it was broken by the crafty author of it, whose schemes had come to the exact point of exposing his ridiculous pretensions.

LITERARY NOTICES.

STATISTICS OF COAL.—A new edition of "Taylor's Statistics of Coal," is published by J. W. Moore, of Philadelphia, to whom we are indebted and grateful for a copy. When the first edition was published a few years ago, its thorough scientific character and accurate information, at once brought new laurels to its able author. The *Edinburgh Review* passed a high eulogium upon it, and with no part of it have we ever heard a fault mentioned. This edition is revised and brought down to 1854, by Prof. S. S. Haldeman, the venerable author having departed this life in 1851. It is chiefly devoted to the coal and iron natural resources of America; and no American, we assert, can have a proper idea, of the vast internal resources of his country, and be ignorant of the contents of this book. No library, public or private, can be complete without a copy of it. It is for sale by John Wiley, of this city.

WEBSTER'S DICTIONARY UNABRIDGED.—Who does not thank Noah Webster for this stupendous literary work—the greatest ever performed by one man? It has met with an extensive sale, and should be possessed by every family, and introduced into every school in our country. It is a complete *thesaurus*—a treasure of knowledge: there is scarcely a bookseller who does not keep it for sale, and a library is as incomplete without it, as the solar system would be without the sun. The publishers, Messrs. Merriam, of Springfield, Mass., have performed the task of publishing this great work with much care and attention.

THE BIBLIOTHECA SACRA—For this month, published by Warren F. Draper, Andover, Mass., has a continuation of Rev. J. L. Porter's tour from Damascus to Baalbeck and Hums. The author is a missionary at Damascus, and gives us a most interesting narrative. A paper on Special Divine Interpositions in Nature, by Professor Hitchcock, crushes all the scientific arguments of the materialists to powder.

BLACKWOOD'S MAGAZINE—The American edition of the last number of this old magazine, has been promptly issued by its enterprising publishers, Messrs. Leonard Scott, & Co., this City. The leading article reviews the speculations of recent writers on the question of the planets being inhabited, in which the author expresses the same opinions as ourselves, in a recent article on this subject. The concluding article is on Spain and Cuba, and should be read by every American; it recommends Spain to sell Cuba to the United States.

PUTNAM'S MONTHLY—For November, is before us, containing, as usual, a goodly number of sterling articles. The leading one is on the "First Discoverers of America," in which the honor of the discovery of our continent is awarded to the Northmen. The interesting biography of Stedingk is continued; and there is a very able essay on the causes and consequences of the Russian War. G. P. Putnam & Co., Publishers, Park Place.

THE KNICKERBOCKER—For November, is rich and rosy with poetry, anecdote, and story. Clark, the mirth-inspiring Editor, has a choice table filled with all sorts of literary knick-knacks for driving "dull care away." Published by S. Hueston, Broadway.